

STATEMENT ON BASIC SCIENTIFIC RESEARCH
January 23, 1993

In its issue of November 23, 1992, TIME Magazine reported the growing cry from some politicians and government officials claiming that the nation's large investment in basic scientific research was failing to improve the lives of Americans. Among the quoted officials were the heads of the two federal agencies whose legislated missions constitute the major U.S. efforts in basic research: the NSF and the NIH. Thus, those whose job it is to support basic research and whose responsibility it is to explain and defend the importance of basic research are, instead, decrying their own programs.

According to TIME, basic research is exemplified by the study of bacteria, which **may** lead to breakthroughs in medicine and biotechnology. Nowhere does the article point out that the seemingly irrelevant intense study of bacteria and related biochemistry begun in the 1940's gave us knowledge breakthroughs in the 50's, 60's, and 70's that lead to the explosion of biotechnology companies beginning in the 80's and now continuing. According to Ernst and Young's Biotech 93 report, there are now, nationwide, 1231 biotechnology companies employing 79,000 people and with sales of \$5.9 billion, all in an industry that did not exist 15 years ago. A map of the location of these companies shows that virtually all of them cluster around the major basic research institutions of the nation: in Georgia, North Carolina, Colorado, Texas, Washington, California, Massachusetts, Connecticut, New York, New Jersey, Maryland, and Virginia. The report states what scientists and investors already know: the biotechnology industry addresses enduring issues in the quality of our lives: hunger, disease, environmental degradation, replacement of exhausted natural resources.

So it would seem that, contrary to the claims of TIME and the directors of the NIH and NSF and even President-elect Clinton, the nation's past investment in basic research was smart and productive. It has always been so. Behind every life-enhancing new technology of the past is the preceding basic research. In bygone times, such research was done by wealthy individuals or by those who were able to attract wealthy sponsors. Now, it can be done by anyone who has the talent, training, and dedication needed to exploit his or her own curiosity about the natural world. Now, it is sponsored by the enlightened governments of the industrialized nations with

1530 P STREET, NORTHWEST • WASHINGTON, D.C. 20005-1910 • 202-387-6400 • FAX 202-387-8092

Department of Plant Biology
Stanford, California

Department of Embryology
Baltimore, Maryland

Department of Terrestrial Magnetism
Washington, D.C.

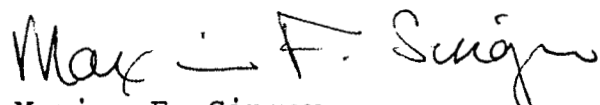
Geophysical Laboratory
Washington, D.C.

The Observatories
Pasadena, California, and Las Campanas, Chile

small, but important assistance from philanthropists and, decreasingly, philanthropic foundations; large corporations have repeatedly said that they cannot and will not sponsor major basic research efforts and that they look to the government to provide for this fundamental activity.

Biotechnology is only the most recent example of the fruits of basic research. The chemical industry, sanitation methods, the computer industry, semiconductors, communications, plastics, nuclear energy, space research, weaponry development, water purification and many more contributors to our daily lives have their roots in basic research, much of it undergirded by federal support.

How can we now assure that a flow of new knowledge will inform our futures and that that knowledge will be productively applied in American industry? First, keep government's basic research and technology policy efforts separate; they involve different kinds of people and enterprises and require different kinds of governmental participation. Second, assure reasonable funding for both activities. Third, nurture the interface between basic researchers and innovative industry to assure timely transfer of technology; this means providing incentives to scientists and industrialists alike and avoiding disincentives (a particularly difficult aspect of this being conflict-of-interest problems for federally funded researchers); fourth, encourage the already sizable efforts of the NIH, NSF, NASA, and other research agencies in linking science education to the conduct of research; this linkage is the secret of the U.S.'s success in training the world's best young scientists who then contribute to applied and developmental research as well as the basic research of the future. Fifth, be sure that the leadership of the basic science agencies understands the importance of their missions. Sixth, optimize the probability of supporting the best basic research by relying on peer review, an imperfect mechanism but the best we have and surely more cost effective than allowing politics to determine what to support. Seventh, use fully, in the service of our nation, the willing wisdom, vision, patriotism, dedication, and intelligence of those with curiosity about the natural world and with dreams to improve all life on our planet.


Maxine F. Singer